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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,484	01/06/2004	Yun-hwa Choi	Q77658	3548
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SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER AHN, SAM K	
			ART UNIT 2611	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/751,484

Applicant(s)

CHOI, YUN-HWA

Examiner

Sam K. Ahn

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see p. 8 and 9, filed 11/28/07, with respect to the rejection(s) of claim(s) 1 and 11 under 102(e) have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Richards et al. US 6,539,213 (Richards, cited previously) and Walker et al. US 2004/0048574 A1 (Walker).

Applicants assert that Richards does not teach wherein a channel coding rate, modulation order and transmission power are changed according to the data transmission scheme. Applicants further assert on page 9 that Walker do not cure deficiencies of Richards. The Examiner disagrees.

Richards teaches wherein at least one of a channel coding rate, modulation order and transmission power is selectively changed according to the data transmission scheme (transmission power control is changed, 1808A in Fig.18).

However, Richards does not teach wherein a channel coding rate and modulation order are changed according to the data transmission scheme.

Walker teaches a UWB transceiver comprising a data transmission scheme changed according to a channel information wherein a channel coding rate and modulation are changed according to the data transmission scheme (note paragraph 0153 wherein modulation order or type and channel coding rate or coding rate transmission parameters are changed, also note claim 13 of Walker). Walker

suggests that this implementation provides a need to transfer information at higher data rates at lower cost and power consumption (note paragraph 0007). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Walker in the system of Richards of not only changing the transmission power, but further enhancing the system by changing the channel coding rate and modulation order depending on data transmission scheme for the purpose of providing a need to transfer information at higher data rates at lower cost and power consumption (note paragraph 0007). Therefore, Richards in view of Walker teach the limitations recited in claims 1 and 11.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,2,5,11,12,15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. US 6,539,213 (Richards, cited previously) in view of Walker et al. US 2004/0048574 A1 (Walker, cited previously).

Regarding claim 1, Richards teaches an ultra wideband (UWB) transceiver (see 702,602 in Fig.11), comprising: a receiver (702, 1011,1116,1014,1124,1126, wherein the elements are interpreted as being part of the receiver) configured to

calculate channel information (1011 providing information of signal strength, received noise and SNR, note col.15, lines 55-57) from a UWB pulse signal (708) received over a UWB channel (706, wireless channel) so that a UWB channel condition can be predicted and a data transmission scheme is changed according to the calculated channel information (transmission scheme using different power control is adjusted based on the SNR, note col.21, lines 29-35, wherein the channel condition is predicted based on propagation path between transceivers in bilateral symmetric communication, note col.21, lines 50-60), whereby information transmission can be efficiently made according to the UWB channel condition (UWB channel condition having a certain path loss, note col.21, lines 50-54, is determined and power control is adjusted accordingly in 1808A in Fig.18). Richards further teaches wherein at least one of a channel coding rate, modulation order and transmission power is selectively changed according to the data transmission scheme (transmission power control is changed, 1808A in Fig.18).

However, Richards does not teach wherein a channel coding rate and modulation order are changed according to the data transmission scheme.

Walker teaches a UWB transceiver comprising a data transmission scheme changed according to a channel information wherein a channel coding rate and modulation are changed according to the data transmission scheme (note paragraph 0153 wherein modulation order or type and channel coding rate or coding rate transmission parameters are changed, also note claim 13 of Walker). Walker suggests that this implementation provides a need to transfer information at higher

data rates at lower cost and power consumption (note paragraph 0007). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Walker in the system of Richards of not only changing the transmission power, but further enhancing the system by changing the channel coding rate and modulation order depending on data transmission scheme for the purpose of providing a need to transfer information at higher data rates at lower cost and power consumption (note paragraph 0007).

Regarding claim 2, Richards further teaches wherein at least one of a channel coding rate, modulation order and transmission power is selectively changed according to the data transmission scheme (transmission power control is changed, 1808A in Fig.18).

Regarding claim 5, Richards further teaches wherein the channel information is a signal-to-noise ratio (SNR) calculated from the received UWB pulse signal (note col.15, line 56, calculated from the signal received via 704 in Fig.11).

Regarding claim 11, the claim is rejected as applied to claim 1 with similar scope.

Regarding claim 12, the claim is rejected as applied to claim 2 with similar scope.

Regarding claim 15, the claim is rejected as applied to claim 5 with similar scope.

Regarding claim 16, Richards teaches all subject matter claimed, as applied to claim 11. And although Richards teaches channel coding and implementing different types of modulation, as previously explained, Richards does not explicitly teach wherein the information transmission scheme performs channel coding for information at a lowest channel coding rate and determines modulation thereof with a lowest modulation order if the information to be transmitted comprises an initial transmission signal.

Walker teaches computing for channel configuration or channel state in a wireless UWB channel between transceivers (see Fig.19) and different information transmission schemes are computed, implemented within the transceiver and even further informed to different transceivers (modulation types and channel coding rate is adjusted accordingly, note paragraphs 0153 and col.18, right column, lines 31-33). Hence, both Richards and Walker teach UWB transceivers wherein Walker further suggests that depending on the channel condition, modulation types and channel coding rate are adjusted in order to perform adaptive signal transmission based on channel condition (note paragraph 0014). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Walker in the system of Richards by adjusting modulation types and channel coding rate for the purpose of adjusting signal transmission based on channel condition (note paragraph 0014).

And further, although Richards in view of Walker do not explicitly teach wherein lowest channel coding rate and lowest order of modulation types are implemented

for initial transmission signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such.

Applicant has not disclosed that such implementation provides an advantage, is used for a particular purpose or solves a stated problem.

One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with other than the lowest because the type of channel coding and modulation types are dependent on user needs and channel condition. If the user of the equipment only desires minimal data rate during initial transmission, one skilled in the art at the time the invention was made would recognize that lowest channel coding rate and lowest order of modulation type is suitable and be performed as such. On the other hand, if the user requirement is to have a high data rate during initial transmission, highest channel coding rate and highest order of modulation type should be implemented. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Richards in view of Walker to obtain the invention as specified in the claim.

It is well-known in the art that different modulation types have different advantages and disadvantages, such as having higher data rate while lower signal to noise ratio, thus may suffer from signal loss due to noise, on the other hand, lower data rate while higher signal to noise ratio, and provide a more robust signaling modulation. Therefore, one skilled in the art may implement QPSK for an application requires a lower data rate while robust against signal noise and implement 16-PSK for application needing higher data rate.

3. Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. US 6,539,213 (Richards) in view of Walker et al. US 2004/0048574 A1 (Walker, cited previously) and Ozluturk et al. US 7,072,380 B2.

Regarding claim 3, Richards in view of Walker teaches all subject matter claimed, as applied to claim 2. And although Richards teaches coded pulse trains (404 in Fig.4), Richards does not explicitly teach a definition of a channel coding rate.

Ozluturk teaches that the channel coding rate is a ratio of the number of information bits to that of the total bits including the information bits and redundant bits that are added for reliable data transmission during coding through a channel encoder (note col.45, lines 12-23). Hence, Ozluturk teaches that a convolutional encoder enables use of forward error correction techniques in order to detect and correct errors (note col.45, lines 12-19). Both Richards and Ozluturk teaches encoding of a signal to be decoded later by its respective receivers wherein Ozluturk further suggests implementing convolution encoder. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Ozluturk in the system of Richards by implementing the convolution encoder in the encoding scheme of Richards to create the signal as illustrated in Fig.4 for the purpose of enabling use of forward error correction techniques in order to detect and correct errors (note col.45, lines 12-19).

Regarding claim 13, the claim is rejected as applied to claim 3 with similar scope.

4. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. US 6,539,213 (Richards) in view of Walker et al. US 2004/0048574 A1 (Walker, cited previously) and Dress, Jr. et al. US 6,603,818 (Dress).

Regarding claim 4, Richards in view of Walker teaches all subject matter claimed, as applied to claim 2. And although Richards teaches wherein the modulation scheme is implemented in a modulator to modulate data (note col.8, lines 22-46) using variety of different types of modulation schemes, Richards does not explicitly teach wherein 4-PSK, 8-PSK and 16-PSK scheme is employed.

Dress teaches a UWB transceiver implementing different types of modulation schemes including QPSK (note col.9, line 24), wherein one skilled in the art the time the invention was made would recognize that 4-PSK, 8-PSK and 16-PSK scheme is part of the same family of PSK. Hence, both Richards and Dress teach a UWB transceiver employing a variety of modulation schemes, wherein Dress further suggests implementing QPSK modulation scheme and also teaches that modulation scheme may be selected depending on application needs (note col.9, lines 22-29). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Dress in the system of Richards by implementing QPSK, 4-PSK, 8-PSK or 16-PSK or any other types of modulation schemes for the purpose of using modulation scheme that suits its application needs, as taught by Dress (note col.9, lines 22-29). *It is well-known in the art that different modulation types have different advantages and disadvantages, such as*

having higher data rate while lower signal to noise ratio, thus may suffer from signal loss due to noise, on the other hand, lower data rate while higher signal to noise ratio, and provide a more robust signaling modulation. Therefore, one skilled in the art may implement QPSK for an application requires a lower data rate while robust against signal noise and implement 16-PSK for application needing higher data rate.

Regarding claim 14, the claim is rejected as applied to claim 4 with similar scope.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. US 6,539,213 (Richards) in view of Walker et al. US 2004/0048574 A1 (Walker, cited previously) and Barnes et al. US 2002/0175850 (Barnes).

Regarding claim 6, Richards in view of Walker teaches all subject matter claimed, as applied to claim 1. Richards further teaches the UWB transceiver comprising:

a transmitter (602 in Fig.11) including a processing means for modulating predetermined information into a UWB pulse signal and transmitting the modulated signal over the UWB channel by using a data transmission scheme determined according to the channel information (according to Signal evaluation 1011, UWB pulse signal output 618 is transmitted and configured by control signals 1122 and output of 1126); and a baseband controller (1014,1126) connected to the transmitter (602) and the receiver (702), respectively, and extracting the channel information from the receiver and forwarding the channel information to the transmitter

(extracted channel information 1106, 1108 and 1110 is provided to the transmitter via 1126 and 1014); wherein the receiver includes a processing means for receiving the UWB pulse signal over the UWB channel and calculating the channel information capable of predicting the UWB channel condition, thereby obtaining original binary information (739 is obtained, and wherein the further limitation is as explained in regards to claim 1).

However, Richards does not explicitly teach generating a timing control signal for synchronization between the transmitter and receiver.

Barnes teaches a UWB transceiver (see Fig.6) wherein a timing control signal is provided to both transmitter and receiver (605 providing timing control signal 607 to the transmitter 601 and receiver). Barnes further suggests that the element 605 provides precise timing signal to both transmitter and receiver (see Fig.6 and note paragraph 0110). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Barnes in the system of Richards of providing a timing control signal to both transmitter and receiver for the purpose of providing a precise timing signal to both transmitter and receiver (see Fig.6 and note paragraph 0110).

6. Claims 7-10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. US 6,539,213 (Richards) in view of Walker et al. US 2004/0048574

A1 (Walker, cited previously) and in further view of Barnes et al. US 2002/0175850 (Barnes) and Takamura US 2003/0035465.

Regarding claim 7, Richards in view of Walker and Barnes teach all subject matter claimed, as applied to claim 6. Richards further teaches a channel encoder for performing channel coding for the information to be transmitted at a predetermined channel coding rate to be suitable for transmission over the UWB channel (transmitting predetermined coded signals 404 in Fig.4 over wireless UWB channel 706); a modulator for modulating the information coded by the channel encoder into the UWB pulse signal in an analog format with a predetermined modulation order (implementing predetermined modulation schemes, note col.8, lines 22-46, wherein one skilled in the art at the time the invention was made would recognize that encoders are coupled to a modulator during signal transmission, and also note col.11, lines 45-46).

Although Richards teaches wherein the power control signal is provided to a pulse generator (622 receiving power control signal from 1126 in Fig.11), Richards in view of Barnes do not explicitly teach an amplifier for adjusting transmission power of the UWB pulse signal output from the modulator to be suitable for the UWB channel transmission.

Takamura teaches a UWB transmitter (see Fig.3) comprising a pulse generator (804) wherein the pulse generator further comprises an amplifier (804-2) and the power or the amplification factor is adjusted (note paragraph 0037). Hence, both Richards and Takamura teach a UWB transmitter comprising a pulse generator

receiving a power control signal to adjust its respective transmitting power wherein Takamura further suggests that the pulse generator comprising the amplifier is adjusted. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to recognize that the pulse generator of Richards includes an amplifier as taught by Takamura for the purpose of controlling and providing pulses adjusted based on the amplification factor (note paragraph 0037).

Regarding claim 8, Richards further teaches wherein the receiver (see 702 in Fig.11) comprises: a correlation detector for calculating the channel information from the UWB pulse signal received over the UWB channel (correlator 710, note col.15, line 32 coupled to 1011 to provide channel information 1106,1108,1110); and a decoder for decoding a data sequence of the UWB pulse signal into an original signal (738 in Fig.11, wherein one skilled in the art would recognize that the encoded signals are decoded in order to provide received data, 739).

Applicants' argument that all calculations are performed in the Signal Evaluation stage 1011 is not persuasive. What calculations are encompassed in the asserted "all calculations"? Richards clearly and specifically uses the word "correlator" in column 15, line 32, which the examiner relies on and noted in the previous office action.

Regarding claim 9, Richards further teaches a channel information processor for extracting the channel information calculated by the receiver and forwarding the channel information to the transmitter (1011 providing power control to the transmitter via 1126); and a timing controller for generating a timing control signal for synchronization between the transmitter and receiver and transmitting the timing control signal to a timing synchronizer (wherein this limitation is explained as applied to claim 6 performed by the baseband controller).

Regarding claim 10, Richards further teaches the baseband controller further comprises a power controller (1126) for generating another control signal (output of 1126) according to the channel information extracted by the channel information processor and controlling transmission power of the UWB pulse signal (based on the channel information 1106, 1108, 1110, power control signal is generated, as previously explained).

Regarding claim 17, the claim is rejected as applied to claim 8 with similar scope.

Conclusion


7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sam K. Ahn
Primary Examiner

2/19/08